UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/395,993	09/15/1999	ALISON JOAN LENNON	169.1451	6766

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EXAMINER
DASTOURI, MEHRDAD

ART UNIT	PAPER NUMBER
2623	

DATE MAILED: 07/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

	Application No.	Applicant(s)	
Office Action Summary	09/395,993	LENNON, ALISON JOAN	
	Examiner	**Art Unit**	
	Mehrdad Dastouri	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>10 July 2003</u> .

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-18,20-35,37-52,54-66,68-80 and 82-93* is/are pending in the application.

  4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-18,20-35,37-52,54-66,68-80 and 82-93* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

  If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

  a)☐ All b)☐ Some * c)☐ None of:

  1.☐ Certified copies of the priority documents have been received.

  2.☐ Certified copies of the priority documents have been received in Application No. _____ .

  3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
    application from the International Bureau (PCT Rule 17.2(a)).

  * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

  a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____ .

Application/Control Number: 09/395,993

Art Unit: 2623

DETAILED ACTION

Continued Prosecution Application

1.   The request filed on June 10, 2003 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 09/395,993 is acceptable and a CPA has been established. An action on the CPA follows.

Response to Amendment

2.   Applicant's amendment filed on October 30, 2002, has been entered and made of record.

3.   Applicant's arguments regarding Claims 1, 18, 35, 52, 66 and 80 have been fully considered but they are not persuasive.

Applicant argues in essence that prior art of record (Modestino et al) do not disclose "analyzing the region adjacency graph to identify predetermined patterns of the semantic labels"

The Examiner disagrees and indicates that Modestino et al clearly disclose this limitation (Abstract Lines 3-10; Figure 1; Pages 607-608, Section II-B. The image in Figure 1a is segmented into homogeneous nodes or regions, $R = \{R_1, R_2, ..., R_n\}$ as depicted in Figure 1(c). Predetermined patterns of the semantic labels are identified as shown in Tables I through IV.).

Applicant further argues that Modestino et al at best teaches only applying low level interpretation labels, and does not teach a higher level expression by associating a stereotype with a plurality of semantic labels.

The Examiner disagrees and indicates that claim language recites "wherein at least one of the regions of the region adjacency graph is associated with at least **one** of

a plurality of predetermined semantic labels". This means that one region (of the RAG)

is associated with only one semantic label. Modestino et al teachings clearly disclose

this concept (Figures 1(a)-1(c), 5(a)-5(d) and 6(a)-6(d); Tables I-IV; Page 606, Section

I, Introduction, Paragraphs 1-3; Pages 610-613, Sections V-VII. Modestino et al

disclose a Markov Random Field (MRF) model-based approach image interpretation

and classification by performing knowledge-based high-level processing via assigning

higher-level expressions (Stereotypes) to the classified objects. The region adjacency

graph is classified based on higher-level expression or stereotypes (e.g., rural road

scenes comprising road, field, car and sky). "Two regions" and "three regions"

categories depicted in Table I in association of Figures 1(a)-1(c) are stereotype or

higher-level expressions consistent with the definition of "Stereotype" in the instant

application Page 7, Lines 11-17. Modestino et al, furthermore, clearly contrast low-level

processing based on the image primitives such as edges and regions, and high-level

processing based on higher-level expressions (Page 606, Section I, second Paragraph).

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5.   Claims 1, 3-10, 18, 20-27, 35, 37-44, 52, 54-61, 66, 68-75 and 80, 82-89 are

rejected under 35 U.S.C. 102(b) as being anticipated by Modestino et al (IEEE Paper

ISBN: 0162-8828; A Markov random Field Model-Based Approach to Image

Interpretation).

Regarding Claim 1, Modestino et al disclose a method of classifying a digital

image, said method comprising the steps of:

segmenting the digital image into substantially homogeneous regions (Figure 1;

Pages 607-608, Section II-B. The image in Figure 1a is segmented into homogeneous

nodes or regions, $R = \{R_1, R_2, ..., R_n\}$ as depicted in Figure 1(c).);

processing the regions to provide a region adjacency graph for the digital image,

the region adjacency graph representing adjacencies between the regions wherein at

least one of the regions of the region adjacency graph is associated with at least one of

a plurality of predetermined semantic labels (Figure 1; Page 607, Column 2, Section IIB,

first Paragraph. $G = \{R, E\}$ is the region adjacency graph comprising of the set of nodes

$R = \{R_1, R_2, ..., R_N\}$ and the set of edges E connecting the regions. The labels assigned

to the segmented regions);

analyzing the region adjacency graph to identify predetermined patterns of the

semantic labels associated with the regions (Figure 1; Page 607, Column 2, Section IIB,

second Paragraph. $L = \{L_1, L_2, ..., L_M\}$ is the set of all predetermined patterns of

regions. Abstract, Lines 3-10; Figure 1; Pages 607-608, Section II-B. The image in

Figure 1a is segmented into homogeneous nodes or regions, $R = \{R_1, R_2, ..., R_n\}$ as

depicted in Figure 1(c). Predetermined patterns of the semantic labels are identified as

shown in Tables I through IV.); and

assigning one of a plurality of predetermined stereotypes to the digital image

according to each identified pattern of the semantic labels associated with the regions,

such that the assigned stereotype represents a classification of the digital image (Figures 1, 5(a)-5(d), 6(a)-6(c); Tables I-IV. The region adjacency graph is classified based on higher-level expression or stereotypes (e.g., rural road scenes comprising road, field, car and sky. "Two regions" and "three regions" categories depicted in Table I in association of Figures 1(a)-1(c) are stereotype or higher-level expressions. The digital image is classified based on the identified patterns (features) of the regions as depicted in Figures 1, 5(a)-5(d), 6(a)-6(c) and Tables I-IV.).

Regarding Claim 3, Modestino et al further disclose the method according to Claim 1, wherein the digital image is classified on the basis of a size of one or more regions of the digital image (Tables I-IV. Classification is based on the areas and the boundary lengths of the regions identified by the RAG nodes.).

Regarding Claim 4, Modestino et al further disclose the method according to Claim 3, wherein the digital image is classified on the basis of an adjacency of the regions (Figures 1 and 6(b). Region adjacency graphs are inherently generated based on the spatial dependence of objects in the relative proximity of each other as depicted in Figure 1(c).).

Regarding Claim 5, Modestino et al further disclose the method according to Claim 1, wherein the digital image is classified on the basis of semantic label content of the region adjacency graph (Page 613, Table III(b). Stereotypes are assigned to region adjacency graph based on the semantic label content, i.e., "road, field" or "sky, field" as depicted in Table III(b).).

Regarding Claim 6, Modestino et al further disclose the method according to Claim 1, wherein the digital image is classified on the basis of a mean color of one or

more regions of the digital image (Page 613, Table III(a), Average Gray Level of the regions).

Regarding Claim 7, Modestino et al further disclose the method according to Claim 1, wherein the plurality of stereotypes are stored in an association lookup table (Page 607, Column 2, Section IIB, second Paragraph. Set of all interpretation labels L is the database or lookup table for stereotypes or node labels.).

Regarding Claim 8, Modestino et al further disclose the method according to Claim 1, wherein the stereotypes are represented in a hierarchal arrangement (Figure 1; Tables I(a) and I9b). Figure 1(c) represents the nodes of stereotype in a hierarchical arrangement based on the number of neighboring regions. Based on associated cliques, Sky, Road and Car are represented in a hierarchical arrangement.).

Regarding Claim 9, Modestino et al further disclose the method according to Claim 7, wherein each of the stereotypes has a hierarchical path arrangement (Figure 1. Sky, Road and Car has a hierarchical path arrangement. Same concept is applicable to the higher-level expressions or node labels in Tables III(b) and IV(b).).

Regarding Claim 10, Modestino et al disclose the method according to claim 1, wherein the region adjacency graph is provided by analyzing contextual data associated with one or more regions of the digital image (Figure 1, Page 607, Section IIB, first Paragraph).

With regards to Claims 18, 35, 52, 66 and 80, arguments analogous to those presented for Claim 1 are applicable to Claims 18, 35, 52, 66 and 80. Concerning Claims 52, 66 and 80, Modestino et al further disclose providing a set of labeled regions (Abstract Lines 5-10; Page 607, Column 2, Section IIB, second paragraph, set of labels

$L = \{L_1, L_2, ..., L_M\}$). Markov Random Field (MRF) model-based approach segments the image into a collection of disjoint regions that form the nodes of an adjacency graph. Once the adjacency graph has been determined, image classification will be achieved through assigning object labels to the segmented regions using domain knowledge, extracted feature measurements, and spatial relationship between the various regions (Abstract, Lines 5-10).

With regards to Claims 20, 37, 56, 70 and 84, arguments analogous to those presented for Claim 3 are applicable to Claims 20, 37, 56, 70 and 84.

With regards to Claims 21, 38, 55, 69 and 83, arguments analogous to those presented for Claim 4 are applicable to Claims 21, 38, 55, 69 and 83.

With regards to Claims 22, 39, 54, 68 and 82, arguments analogous to those presented for Claim 5 are applicable to Claims 22, 39, 54, 68 and 82.

With regards to Claims 23, 40, 57, 58, 71, 72, 85 and 86, arguments analogous to those presented for Claim 6 are applicable to Claims 23, 40, 57, 58, 71, 72, 85 and 86.

With regards to Claims 24, 41, 59, 73 and 87, arguments analogous to those presented for Claim 7 are applicable to Claims 24, 41, 59, 73 and 87.

With regards to Claims 25, 42, 60, 74 and 88, arguments analogous to those presented for Claim 8 are applicable to Claims 25, 42, 60, 74 and 88.

With regards to Claims 26, 43, 61, 75 and 89, arguments analogous to those presented for Claim 9 are applicable to Claims 26, 43, 61, 75 and 89.

With regards to Claims 27 and 44, arguments analogous to those presented for Claim 10 are applicable to Claims 27 and 44.

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

7.   Claims 11, 17, 28, 34, 45, 62-65, 76-79 and 90-93 are rejected under 35

U.S.C. 103(a) as being unpatentable over Modestino et al in view of Li et al (U.S.

5,930,783).

Regarding Claim 11, Modestino et al do not explicitly disclose the method

according to Claim 10, wherein the contextual data comprises information generated by

one or more separate sources of the information.

Li et al disclose a semantic and cognition based image retrieval methodology

comprising analyzing contextual data generated by one or more separate sources of

information (Figure 1B, Semantic-based Query, Cognition-based Query; Column 12,

Lines 30-40).

It would have been obvious to a person of ordinary skill in the art at the time the

invention was made to modify Modestino et al invention according to the teachings of Li

et al to analyze contextual data generated by one or more separate sources of

information because it will expand versatility of the image segmentation and

classification. It will utilize the advantages of image retrieval based on both image

semantics and visual examples of the image (Li et al, Column 3, Lines 27-35).

Regarding Claim 17, Modestino et al do not explicitly disclose the method according to Claim 1, wherein said digital image is stored in a database of digital images and wherein said classification can be used to retrieve said digital image from said database.

Li et al disclose a semantic and cognition based image retrieval methodology wherein the digital image is stored in a database of digital images and wherein the classification can be used to retrieve said digital image from the database (Column 4, Lines 32-50).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Modestino et al invention according to the teachings of Li et al to use classification to retrieve the digital images stored in a database because it will utilize a plurality of information sources for image retrieval including semantic-based, cognition-based and scene-based queries thereby eliminating weakness of the individual approaches (Li et al; Column 3, Lines 27-35).

With regards to Claims 28 and 45, arguments analogous to those presented for Claim 11 are applicable to Claims 28 and 45.

With regards to Claim 34, arguments analogous to those presented for Claim 17 are applicable to Claim 34.

With regards to Claims 63, 77 and 91, arguments analogous to those presented for Claim 17 are applicable to Claims 63, 77 and 91. Li et al retrieve the digital image by using a keyword representing a stereotype (Column 12, Lines 30-50).

With regards to Claims 64, 78 and 92, arguments analogous to those presented for Claim 17 are applicable to Claims 64, 78 and 92. Neither Modestino nor Li et al

explicitly retrieve the digital image by using an icon to represent a stereotype. Utilizing an icon to represent a keyword is extremely well known in the art (Official Notice).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Modestino et al and Li et al combination to Utilize an icon for representing a keyword because icons are a significant factor in the user-friendliness of graphical user interface that serve as visual mnemonics to allow the user to control certain computer actions without having to remember commands or type them at the keyboard.

With regards to Claims 62, 76 and 90, arguments analogous to those represented for Claim 64 concerning utilizing an icon is applicable to claims 62, 76 and 90.

With regards to Claims 65, 79 and 93, arguments analogous to those presented for Claim 17 are applicable to Claims 65, 79 and 93. Li et al retrieve the digital image by using a keyword representing a generalization of a stereotype (Column 12, Lines 30-50).

8.   Claims 12, 29 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Modestino et al further in view of Li et al (U.S. 5,930,783) and Jain et al (US 6,360,234).

Regarding Claim 12, neither Modestino et al nor Li et al disclose the method according to Claim 11, wherein a corresponding portion of said contextual data is obtained from a temporal region of interest for each source of said information.

Jain et al disclose a method for video cataloging by providing metadata associated with the image wherein a corresponding portion of contextual data is

obtained from a temporal region of interest for each source of information (Figures 6-9;

Column 6, Lines 30-67).

It would have been obvious to a person of ordinary skill in the art at the time the

invention was made to modify Modestino et al and Li et al combination according to the

teachings of Jain et al to obtain a corresponding portion of the contextual data from a

temporal region of interest for each source of information because it will accurately

classify and intelligently extract information, termed metadata, about the contents of

video stream in real time (Jain et al, Column 1, Lines 46-49).

With regards to Claims 29 and 46, arguments analogous to those presented for

Claim 12 are applicable to Claims 29 and 46.

9.   Claims 13-16, 47-51 and 30-33 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Modestino et al in view of Jain et al (US 6,360,234).

Regarding Claim 13, Modestino et al do not disclose the method according to

Claim 1, further comprising the step of providing metadata associated with the digital

image, wherein the metadata includes the stereotypes of the digital image.

Jain et al disclose a method for video cataloging by providing metadata

associated with the image comprising the step of providing metadata associated with

the digital image, wherein the metadata includes the stereotypes of the digital image

(Figures 16 and 17; Column 13, Lines 52-67, Column 14, Lines 1-31).

It would have been obvious to a person of ordinary skill in the art at the time the

invention was made to modify Modestino et al invention according to the teachings of

Jain et al to provide metadata associated with the digital image, wherein the metadata

includes the stereotypes of the digital image because it will improve image appearance

and enhance image classification.   It will accurately classify and intelligently extract

information, termed metadata, about the contents of video stream in real time (Jain et

al, Column 1, Lines 46-49)

Regarding Claim 14, Jain et al further disclose the method according to Claim 13,

wherein the metadata includes a hierarchical path associated with the respective

stereotype of each digital image (Figures 9, 15-17; Table 1; Column 8, Lines 22-61).

Regarding Claim 15, Jain et al further disclose the method according to Claim 14,

wherein the hierarchical path is stored with a respective stereotype as a metadata

object which is associated with a respective image object (Figure 6; Column 6, Lines

29-38).

Regarding Claim 16, Jain et al further disclose the method according to Claim 14,

wherein the hierarchical path is stored as a referenced lookup table (Figure 7).

With regards to Claim 47, arguments analogous to those presented for Claim 13

are applicable to Claim 47.

With regards to Claim 48, arguments analogous to those presented for Claim 14

are applicable to Claim 48.

With regards to Claim 49, arguments analogous to those presented for Claim 15

are applicable to Claim 49.

With regards to Claim 50, arguments analogous to those presented for Claim 16

are applicable to Claim 50.

With regards to Claim 51, arguments analogous to those presented for Claim 17

are applicable to Claim 51.

Regarding Claim 30, Modestino et al do not disclose the method according to
Claim 18 further comprising the step of providing metadata associated with the digital
image, wherein the metadata includes the stereotypes of the digital image.

Jain et al disclose a method for video cataloging by providing metadata
associated with the digital image, wherein the metadata includes stereotypes of the
digital image (Figures 16 and 17; Column 13, Lines 52-67, Column 14, Lines 1-31).

It would have been obvious to a person of ordinary skill in the art at the time the
invention was made to modify Modestino et al invention according to the teachings of
Jain et al to provide metadata associated with the digital image, wherein the metadata
includes stereotypes of the digital image because it will accurately classify and
intelligently extract information, termed metadata, about the contents of video stream in
real time (Jain et al, Column 1, Lines 46-49).

With regards to Claim 31, arguments analogous to those presented for Claim 14
are applicable to Claim 31.

With regards to Claim 32, arguments analogous to those presented for Claim 15
are applicable to Claim 32.

With regards to Claim 33, arguments analogous to those presented for Claim 16
are applicable to Claim 33.

Contact Information

10.   Any inquiry concerning this communication or earlier communications from the
examiner should be directed to Mehrdad Dastouri whose telephone number is (703)
305-2438. The examiner can normally be reached on Monday to Friday from 8:00 a.m.

to 4:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the

examiner's supervisor, Amelia Au can be reached on (703) 308-6604.

The fax phone numbers for the organization where this application or proceeding

is assigned are (703) 872-9314 for regular and for After Final communications.

Any inquiry of a general nature or relating to the status of this application or

proceeding should be directed to the receptionist whose telephone number is (703) 305-

4700.

Mehrdad Dastouri
Primary Examiner
Group Art Unit 2623
July 22, 2003